



SoCal EV Collaborative: EV101

**Frank Wong, Senior Manager Marketing,
EV Solutions**



AeroVironment & Innovation

Clean Transportation Experts for the Last 40 Years

- AeroVironment (AV) develops, manufactures, and markets Efficient Energy technologies and Unmanned Aircraft Systems
- NASDAQ: AVAV
AV focuses on the development and commercialization of innovative technologies
- A unique record of achievement
 - Industrial PosiCharge™, market-leading industrial EV fast charging – over 14,000 systems delivered
 - Pioneer and market leader in small unmanned aircraft systems – over 15,000 air vehicles delivered
 - Leading provider of testing and simulation systems to EV, PHEV, and advanced battery and fuel cell developers
 - Global Observer, first liquid-hydrogen powered unmanned aircraft system
 - Conceived and developed the GM Impact, the first modern EV



Driving the Broad Adoption of EVs with Innovative Solutions



Over two decades of EV expertise

1989



The first modern EV



"Gen 1"
Public EV Chargers



Industrial EV Charging



EV Testing and Simulation



Fleet EV Solutions

2010



"Gen 2"
Public EV Fast Chargers

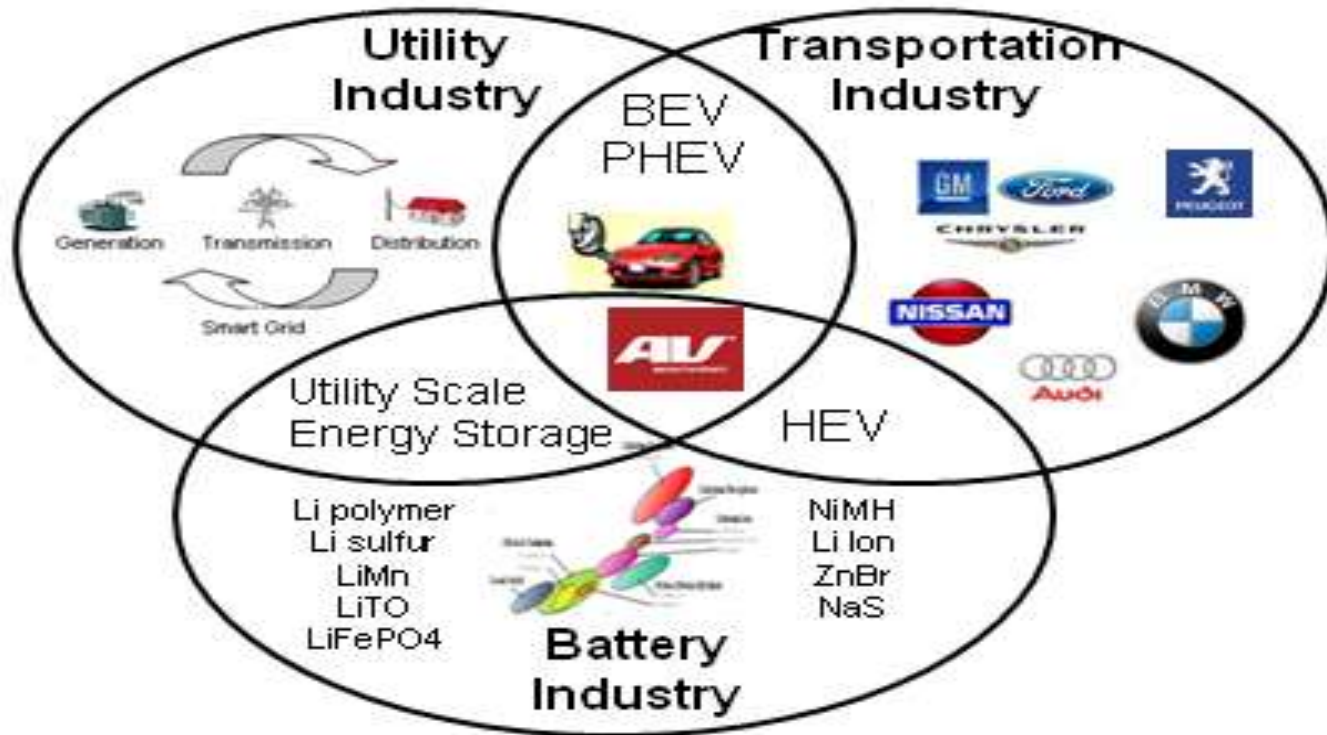


Home Charging Solutions



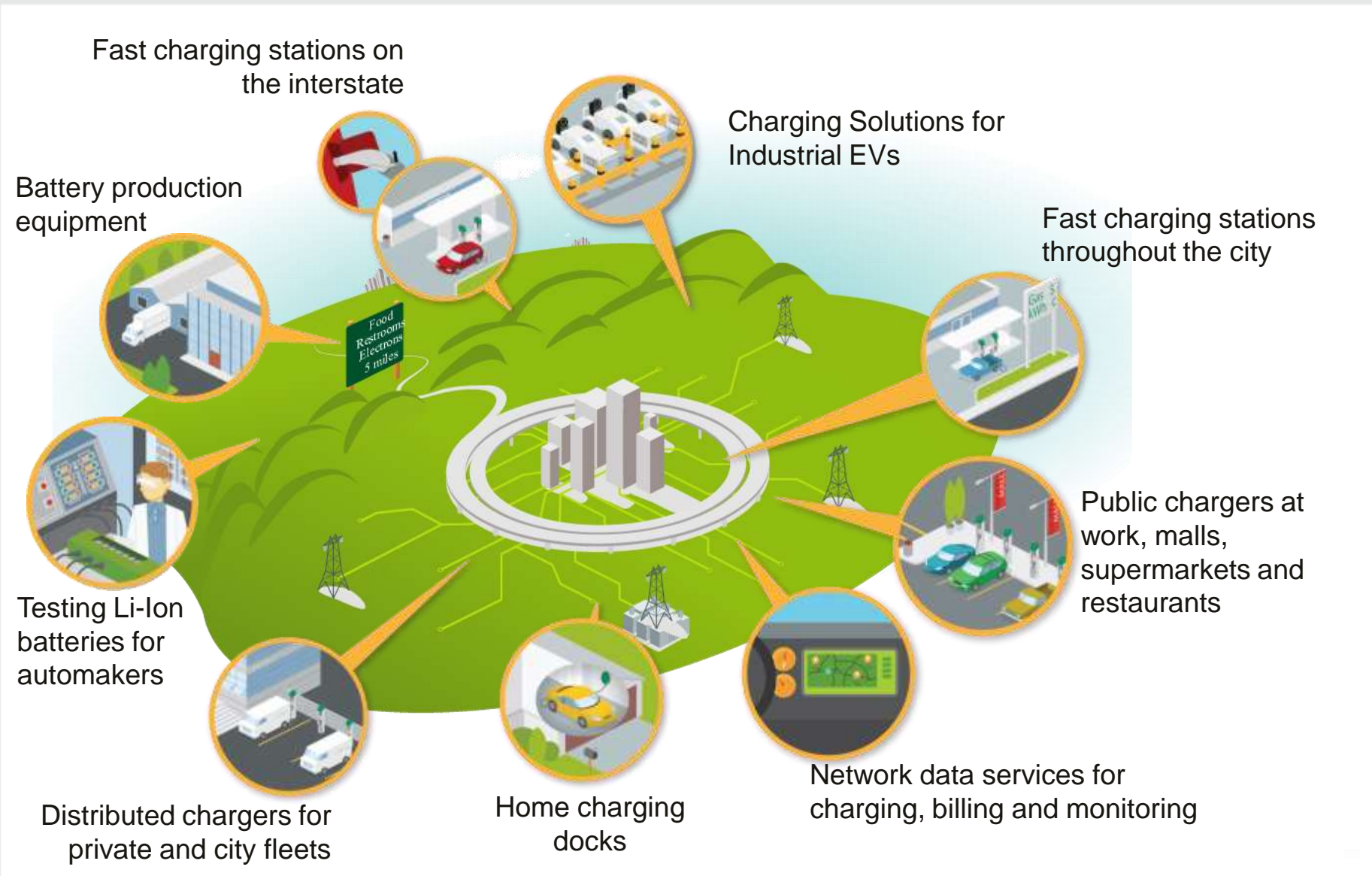
systems integration

Infrastructure Positioned for Market Disruption



- EVs will require combination of home and public charging solutions
- EV charging at nexus of transportation & smart grid inter-play
- Energy storage is key in smart grid implementation
- Smart charging creates value potential for both industries

AV Charging Solutions Across EV Ecosystem



The EVSE Hardware

Application Breadth, Functionality Depth



Home Charging Solutions



Public Charging Solutions

EVSE-RS

Base EVSE configuration
Wall or pedestal mount
Indoor or outdoor
Single-phase up to 30A
Smart module option

EVSE-ES

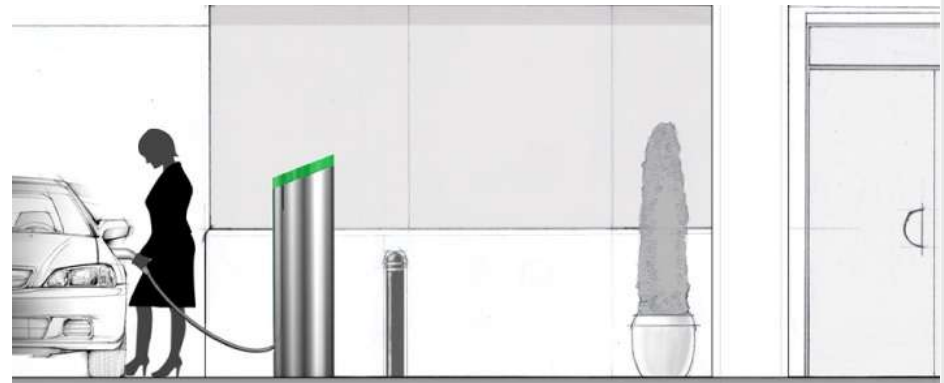
With the IEC16296 inlet,
Mode 3, Type 2 (Mennekes).
Wall or pedestal mount
Indoor or outdoor
Smart module option

EVSE-Multi

Dual configuration
Quad configuration
All functionality of RS
Reduced install cost
Weather resistant

EVSE-CS

Commercial outdoor
Fleets and public charging
POS and cord security
Adaptable 3-phase input
Comm options



Fast Charging & Mobile Solutions

Providing EV Solutions for Deployment Success



Fast Charging Solutions



Mobile Charging Solutions



EV50-CS

Iconic, Public, CHAdeMO Standard, Fast Chargers.
Able to provide 50kWw
With RFID, HMI and POS

EV50-FS

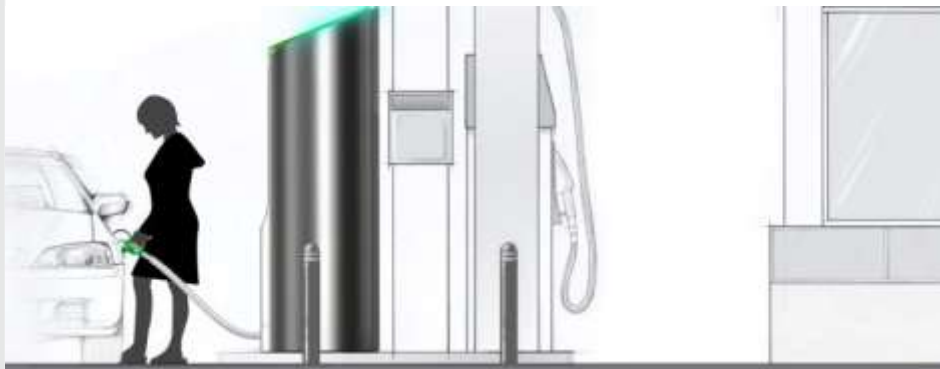
Fleet, Private, CHAdeMO Standard, Fast Chargers.
Able to provide 50kW
With RFID and POS

EVBoost

Ruggedized kits to provide a limited amount of charge to EVs with depleted batteries. Also supports EV transportation.

Cordsets

Cordsets that support SAE Level 1 and Level 2 needs in US and Asia, and IEC62196 (J1772, Mennekes, and SCAME) needs in Europe.



Infrastructure and Network Services

Providing Data and IT-Driven Solutions

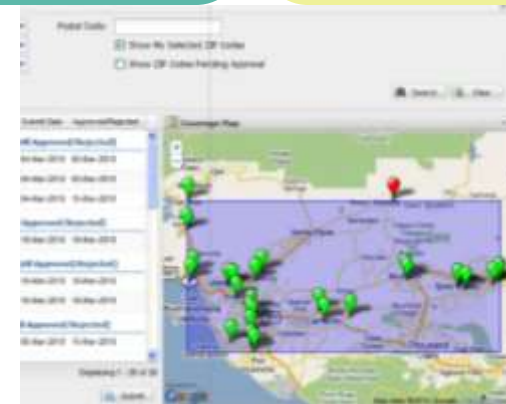


EV Data
Communications links and
Back end systems that
Provide Portal and mobile
Access to Charger Data.

Utility Integration
Demonstrated Integration
with Utilities Advanced
Metering and Energy
Mgmt Platforms with open,
Standards-based options.

CRM Backend
Robust CRM System ready
for OEM integration,
utilizing EV owner,
Installer, and OEM touch
points to ensure complete
customer satisfaction.

ERP System
3PL, IT backend, and in-
field tools able to provide
information & traceability
at all stages of product
and service fulfillment.



eVgo Network – NRG Energy Inc.

- First privately funded electric vehicle (EV) charging “ecosystem”
- Integrated network of products, services and payment plans that helps make EVs practical for drivers
- AV supplying, installing, and supporting smart home and public charging stations, as well as integrated data collection, communication and analysis systems
- NRG plans to invest approximately \$10 million in Houston’s public charging infrastructure, including at least 50 high-powered fast charging stations, by mid-2011.



LEAF DC Fast Charging & OEM Support

Providing EV Solutions for Deployment Success



Public and Infrastructure Installations

Providing EV Solutions for Deployment Success



AV Installation Services Overview

End-to-End Support

■ The Team

- Experienced and exclusive installers/service providers
- Comprehensive national coverage
- Licensed and insured electricians
- Guaranteed availability
- Local codes/permitting knowledge
- Fully trained and certified



■ The Installation Services

- Real time/Web based scheduling and payment
- Site assessments and application services
- Service upgrades (trenching, panel upgrades)
- Turn-key installation
- Complimentary on-site user training



■ The Post Installation Services

- Comprehensive call center and help desk support
- On-site troubleshooting
- Proprietary service tools for easy vehicle simulation and troubleshooting



Level 3 / DC Fast Charging

“Level 3” / DC Charging:

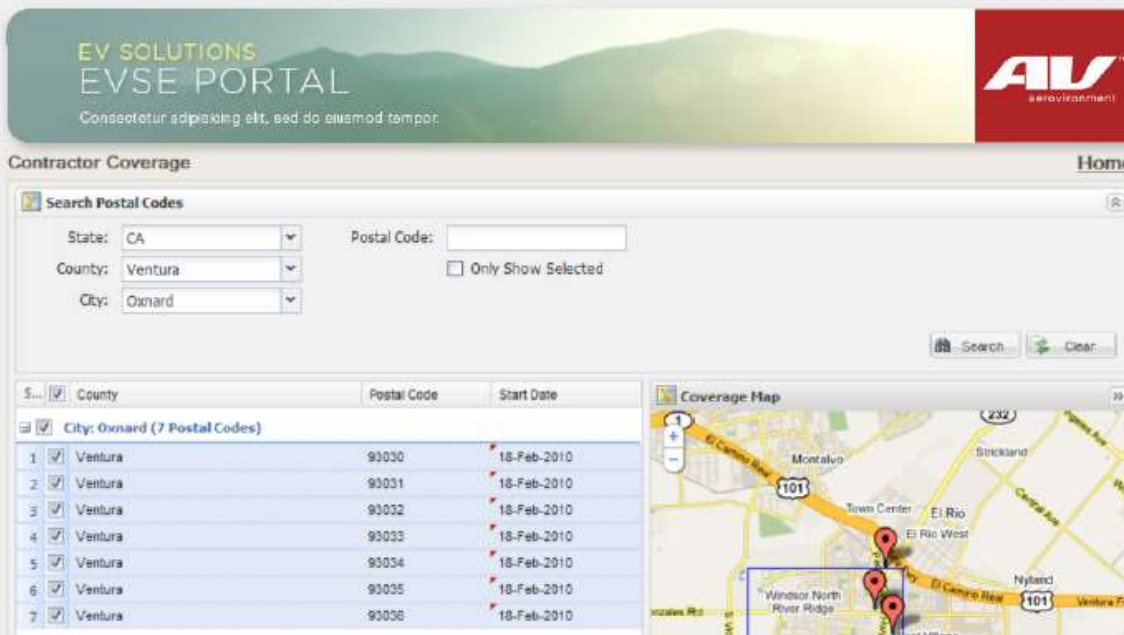
AKA “Quick Charging” stations employ higher power DC to bypass the vehicle’s on-board charger with a fast and reliable charge in minutes instead of hours. AV’s DC charging solutions have been vetted for more than a decade in heavy-duty industrial applications – including auto plants, airports, and retail distribution.



Level 3 DC charging is ideal for public charging infrastructure; charging large vehicles with big batteries such as buses; and commercial or service fleets with very little recharging downtime.

Integration with Utilities – Key Elements

- Resource Planning Support & EV Charging Infrastructure Integration
- Education & Training
- Installation Services: Smart sub meter scheduling & installation
- Demand Response Planning
- AMI, Wireless Communications, Subscription
- Web Based Asset Management



EV SOLUTIONS EVSE PORTAL
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Contractor Coverage

Search Postal Codes

State: CA Postal Code:

County: Ventura ☐ Only Show Selected

City: Oxnard

Search Clear

S...	County	Postal Code	Start Date
1	Ventura	93030	18-Feb-2010
2	Ventura	93031	18-Feb-2010
3	Ventura	93032	18-Feb-2010
4	Ventura	93033	18-Feb-2010
5	Ventura	93034	18-Feb-2010
6	Ventura	93035	18-Feb-2010
7	Ventura	93036	18-Feb-2010

Coverage Map

Map showing charging locations in Oxnard, CA, including areas like Montalvo, Strickland, El Rio, El Rio West, Windsor North, River Ridge, and Nylund.



Charging Infrastructure: A Formula for Success

- **Convenient**
 - Locate charging stations where drivers need and expect them: home, work, retail, highway
 - Pay at the pump for public and fast charging
 - Standard connectors and open networks that work with all EVs for all drivers
- **Fast**
 - Critical to adoption- alleviates 'range anxiety'
 - Charging in minutes, not hours
- **Proven**
 - EV fast charging has been proven in the industrial market, where it is replacing battery swapping
 - Thousands of systems already operating
- **Innovative**
 - Bi-directionality allows for vehicle-to-grid (V2G) connectivity and peak shaving



Thank you for your time.

Contact Information

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